

REMARKS/ARGUMENTS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1-5, 11-15 and 21-22 are pending in this application. Claims 6-10 and 16-20 are canceled without prejudice or disclaimer by the present amendment. No new matter is added.

In the outstanding Office Action, Claims 1 and 11 were rejected under 35 U.S.C. 103(a) as unpatentable over Negrelli et al. (U.S. Patent No. 5,712,895, herein "Negrelli") in view of Strobel (U.S. Patent No. 6,650,724); Claims 6, 16, 21 and 22 were rejected under 35 U.S.C. 103(a) as unpatentable over Negrelli in view of Strobel and in further view of Klotz (U.S. Patent 5,852,646); Claims 2-5 and 12-15 were rejected under 35 U.S.C. 103(a) as unpatentable over Negrelli in view of Strobel and in further view of Vining (U.S. Patent No. 5,782,762); and Claims 7-10 and 17-20 were rejected under 35 U.S.C. 103(a) as unpatentable over Negrelli in view of Strobel, Klotz, and Vining.

Applicant respectfully requests reconsideration of the rejection under 35 U.S.C. §103(a), and traverses the rejection, as discussed next.

Applicant's independent Claim 1 relates to a 3D image processing apparatus, comprising, *inter alia*:

...a first subtracting unit configured to generate data of a plurality of subtraction images by subtracting the plurality of mask images from the plurality of contrast images;

a reconstruction unit configured to reconstruct first volume data from the plurality of contrast images and configured to reconstruct second volume data from the plurality of subtraction images;

a second subtracting unit configured to generate mask volume data by subtracting the second volume data from the first volume data,

an image processing unit configured to generate data of a first 3D image representing a bone structure and/or a soft tissue structure from the mask volume data, and configured to

generate data of a second 3D image representing a contrasted blood vessel from the second volume data...

Independent Claim 11 recites substantially similar features. Accordingly the arguments presented below are applicable to each of independent Claims 1 and 11.

As explained in Applicant's specification from page 1, line 27, to page 2, line 2, Applicant's Claim 1 improves upon background 3D image processing apparatuses by separating blood vessels from the bones clearly, and displaying blood vessels in high definition.

Turning to the applied references, Negrelli discloses a rotational digital subtraction angiography system, wherein a test phantom is used for a calibration procedure.¹ Negrelli further explains that the calibration system includes a subtraction circuit for generating a subtracted image between the forward sweep rotation image and the corresponding reverse sweep rotation image.²

Negrelli, however, fails to teach or suggest the *second subtracting unit*, as recited in independent Claim 1, *configured to generate mask volume data by subtracting the second volume data from the first volume data*. As recited in independent Claim 1, the second volume data is constructed from the plurality of subtraction images (contrast images-mask images), and the first volume data is constructed from the contrast images.

In addressing this claimed feature, the Official Action cites col. 2, lines 55-60 and Fig. 1 of Negrelli and states that "though it is not explicitly taught that mask data is generated by subtracting the subtraction data from the contrast data, it would have been obvious... to perform this subtraction by substituting the subtraction image for the mask image and

¹ Negrelli, col. 1, lines 5-12 and lines 55-67.

² Id., col. 2, lines 55-60, from col. 5, line 66, to col. 6, line 2, and in Fig. 1, item 86.

perform the same subtraction from the contrast data because all the data for the contrast, mask and subtraction images are all generated as taught by Negrelli.”

However, Negrelli also states that “the image subtraction/overlay circuit 86 subtracts the forward and reverse images (i.e. the mask and contrast images) to create only an image of the circulatory system for display on the monitor 88.” Further, Negrelli clearly describes that any mask data subtracted from the contrast data to create the display only of the circulatory system is generated from the forward and reverse images, and not from subtracting subtraction images from the contrast images, as recited in independent Claim 1.

Additionally, as described in the present specification, the processing performed at the second subtracting unit allows for mask images and contrast images to be processed such that the bones/soft tissue of the mask image and the vessels of the contrast images are clearly distinguished when images are displayed *together*. As Negrelli describes that his object is to create only an image of the circulatory system, it would not have been obvious to one of ordinary skill in the art at the time of the invention to perform additional processing to display mask data. Specifically, the processing performed in the claimed second subtracting unit is not obvious based on the circulatory system display only system of Negrelli.

Strobel, the secondary reference, is relied upon only to address the “image processing unit” and “image synthesizing unit” features. Nonetheless, Strobel also fails to teach or suggest *a second subtracting unit configured to generate mask volume data by subtracting the second volume data from the first volume data*, in view of the definition of the first volume data and second volume data as recited in independent Claim 1.

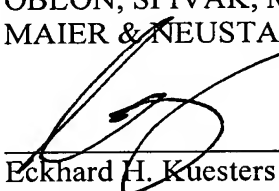
Therefore, even if the combination of Negrelli and Strobel is assumed to be proper, the combination fails to teach, or render obvious, the second subtraction unit, as recited in independent Claims 1 and 11. Accordingly, Applicant respectfully traverses, and requests reconsideration of, the rejection of Claims 1 and 11 based on these patents.

Further, the Vining and Klotz references, relied upon by the outstanding Office Action to form a 35 U.S.C. §103(a) rejection of the dependent claims, does also not remedy the deficiencies of Negrelli and Strobel. Vining is merely concerned with 3D graphics rendering for selected body organs,³ and does not teach or suggest anything similar to the claimed second subtraction unit (Claims 1 and 11). Similarly, Klotz is relied upon only to address the calibration unit feature recited in dependent Claims 21 and 22, and also fails to teach or suggest the above differentiated claimed features. Therefore, Applicant respectfully traverses the rejection of the dependent claims, and requests reconsideration of the rejection.

Consequently, in view of the present amendment, no further issues are believed to be outstanding in the present application, and the present application is believed to be in condition for formal Allowance. A Notice of Allowance for Claims 1-5, 11-15 and 21-22 is earnestly solicited.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



Eckhard H. Kuesters
Attorney of Record
Registration No. 28,870

Customer Number
22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 06/04)

Andrew T. Harry
Registration No. 56,959

I:\ATTY\ATH\PROSECUTION\24'S\242158US\242158US-AMDT DUE 1-19-07.DOC

³ Vining, Abstract.